

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>25441 WO</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/002592</b>	International filing date (day/month/year) <b>12.03.2004</b>	Priority date (day/month/year) <b>13.03.2003</b>
International Patent Classification (IPC) or national classification and IPC		
Applicant <b>EKRA EDUARD KRAFT GMBH</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. I

## Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-11 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 1-9 \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1/1 \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-9	YES
	Claims		NO
Inventive step (IS)	Claims	1-9	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
1. Reference is made to the following documents:			
<p>D1: DE 39 28 527 A1 (INDUSTRIE-SIEBDRUCK-SYSTEME NECKARWEIHINGEN GMBH, 7140 LUDWIGSBURG, DE) 14 March 1991 (1991-03-14)</p> <p>D2: EP-A-0 906 827 (MATSUSHITA ELECTRIC INDUSTRIAL CO LTD) 7 April 1999 (1999-04-07)</p> <p>D3: PATENT ABSTRACTS OF JAPAN, Vol. 1999, No. 13, 30 November 1999 (1999-11-30) &amp; JP 11 218406 A (TANI DENKI KOGYO KK) 10 August 1999 (1999-08-10)</p>			
<p>2. D1 (<i>figure 1; column 5, line 49 - column 7, line 10; column 7, line 54 - column 8, line 27</i>) is considered the closest prior art. D1 discloses (the references in parentheses relate to said document) a method for aligning a substrate (20) and a printing screen (23) relative to one another when printing the substrate with solder paste, with the following steps:</p> <p>a. arranging the substrate (20) opposite the printing screen (23);</p> <p>b. inserting an optical detection device (endoscope,</p>			

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	<p>32a-32d) between the side of the substrate that is to be printed and the printing screen (column 2, lines 24-36);</p> <p>c. detecting position-defining structures of the substrate (81, 82) and the printing screen (83, 84) using the optical detection device (column 2, lines 24-36; column 3, lines 23-38);</p> <p>d. aligning the substrate and the printing screen relative to one another on the basis of information obtained from detecting the structure (column 4, lines 63-68),</p> <p>from which the subject matter of independent claim 1 differs in that a second optical detection device detects reference data of position-defining structures on the side of the first aligned substrate that faces away from the side that is to be printed. These reference data are used for the alignment of further substrates. The alignment is carried out on the basis of a comparison of the actual data of the subsequent substrates, which are detected by the second optical detection device using the reference data of the first substrate.</p> <p>2.1 The subject matter of claim 1 is therefore novel (PCT Article 33(2)). The problem addressed by the present invention can therefore be considered that of reducing the time taken for the cycle of applying solder paste (see application, page 2, lines 15-27).</p>

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2.2	<p>The solution to this problem proposed in claim 1 of the present application is the use of a second optical detection device for aligning further substrates (see application, page 3, lines 19-24). This means that the insertion and removal of the first optical detection device between the side of the subsequent substrates that is to be printed and the printing screen, for aligning the substrates and the printing screen, is no longer required and the printing cycle can be carried out considerably more quickly (see application, page 4, line 27 - page 5, line 6). A method such as this is neither known from the prior art, nor is the solution obvious therefrom. <b>D2</b> (<i>figures 5, 6; paragraphs 7-10</i>) discloses a method for aligning a substrate and a printing screen relative to one another on the basis of the optical detection of position-defining structures (2, 5) on the substrate (1) and the printing screen (4) using a camera (6). <b>D3</b> (<i>abstract</i>) discloses the optical detection of a marking (6) on a substrate (5), e.g. for aligning the substrate in a printing process. The subject matter of claim 1 therefore involves an inventive step (<b>PCT Article 33(3)</b>).</p> <p>3. The subject matter of independent claim 2 is merely a variant of the subject matter of independent claim 1. The alignment of substrate and printing screen relative to one another is carried out on the basis of correction data of the relative position of the first substrate to the printing screen, of reference data of the first</p>

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substrate and actual data of the subsequent substrates which are detected by the second optical detection device. The subject matter of claim 2 is therefore novel (PCT Article 33(2)) and involves an inventive step (PCT Article 33(3)) for similar reasons to claim 1.

4. A device for aligning the substrate and printing screen relative to one another during the printing of the substrate with solder paste, in particular for carrying out the method according to claims 1 or 2, with:
- a first optical detection device that can be inserted and withdrawn from between the side of the substrate that is to be printed and the printing screen;
  - a second optical detection device that inspects a side of the substrate that is opposite the side that is to be printed, and
  - a correction device that processes the detection data of the first optical detection device and the inspection data of the second optical detection device so as to correct the position of the substrate and the printing screen relative to one another
- is neither known nor obvious from the available prior art. The subject matter of claim 3 is therefore novel (PCT Article 33(2)) and involves an inventive step (PCT Article 33(3)), for similar reasons to those given in paragraphs 2.1-2.2 above.

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5.	Claims 4-9 are dependent on claims 1-3 and therefore likewise meet the PCT novelty and inventive step requirements.